Emphysematous Cystitis: A Case Report

Amfizematöz Sistit: Olgu Sunumu

Emphysematous Cystitis

Süleyman Tağcı, Cüneyt Özden, Cevdet Serkan Gökkaya, Binhan Kağan Aktaş, Süleyman Bulut
Urology Clinic, Ankara Numune Training and Research Hospital, Ankara, Türkiye

Özet

Amfizematöz sistit mesane lümeninde ve duvarında hava birikimi ile karakterize enfeksiyöz bir hastalıktır. Diabetes mellitus, nörojenik mesane ve ileri yaş hastalığın gelişiminde önemli risk faktörleridir. Bu makalede kliniğimizde amfizematöz sistit tanısı ile tetkik ve tedavi edilen nörojenik mesaneli ve diyabetik genç bir erkek olgu sunulmaktadır.

Anahtar Kelimeler

Amfizematöz Sistit; Diabetes Mellitus; Üriner Enfeksiyon

Abstract

Emphysematous cystitis is an infectious disease, which is characterized by accumulation of air within the lumen and wall of the bladder. Diabetes mellitus, neurogenic bladder and advanced age are important risk factors for the development of the disease. In this case report, we present a young diabetic male patient with neurogenic bladder, who was treated with the diagnosis of emphysematous cystitis.

Keywords

Emphysematous Cystitis; Diabetes Mellitus; Urinary Tract Infection.

DOI: 10.4328/JCAM.4119 Received: 26.11.2015 Accepted: 10.12.2015 Printed: 01.01.2016 J Clin Anal Med 2016;7(1): 138-40
Corresponding Author: Binhan Kağan Aktaş, Üroloji Kliniği, Ankara Numune Eğitim ve Araştırma Hastanesi, 06100, Altındağ, Ankara, Türkiye.
T.: +90 3125085279 F.: +90 3123114340 E-Mail: kaanaktas73@hotmail.com

Introduction

Emphysematous cystitis is a severe lower urinary tract infection, which is characterized by accumulation of air within lumen and wall of the bladder. Diabetes mellitus, neurogenic bladder and advanced age are important risk factors for development of emphysematous cystitis [1]. Clinical findings show a wide distribution; just as asymptomatic cases, lethal cases may be encountered with. Early diagnosis and treatment of emphysematous cystitis is extremely important in order to prevent serious morbidity, such as bladder necrosis, emphysematous pyelonephritis, and sepsis. As there is no typical clinical sign, diagnosis can be made by imaging studies rather than clinical. In this report, we present a case who admitted to our clinic with the complaint of suprapubic pain and eventually diagnosed with emphysematous cystitis by computed tomography (CT), and discuss the diagnosis and treatment of the disease in light of current literature.

Case Report

Twenty-nine-year-old male was admitted with complaints of one month-long suprapubic pain, a sensation of burning during urination, air bubbles coming from urethra, a feeling of residual urine, frequent urination more than 10 times a day and 6-7 times a night. Histories of type 1 diabetes mellitus, hypothyroidism, asthma, pneumothorax, cirrhosis and variceal bleeding were present in patient's medical history. Suprapubic tenderness was detected on physical examination. Laboratory analysis revealed that blood glucose level was 255 mg/dL, creatinine was 0.96 mg/dL, and leukocytes were 4400/mm3. Abundant leukocytes and erythrocytes were present in urinalysis. More than 105 colony forming units/mL of Escherichia coli, sensitive to ceftriaxone, were detected in urine culture. Abdominopelvic CT showed accumulation of air within lumen and wall of the bladder and multiple round radiodense bladder stones, the largest measuring 1 cm in diameter (Figure 1). The patient was

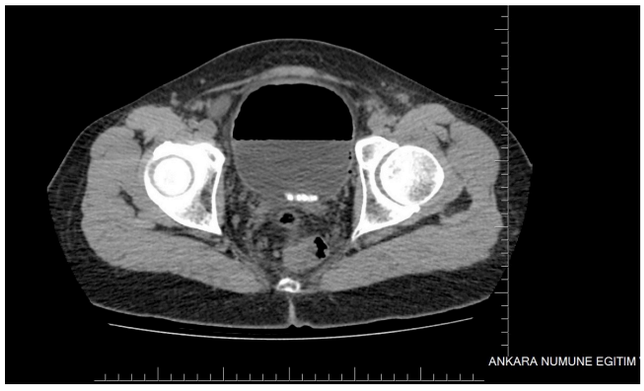

Figure 1. The view of air within the lumen and wall of the bladder on CT.

hospitalized, intravenous ceftriaxone (1000 mg bid.) treatment was initiated, and elevation of blood glucose level was regulated by insulin. Pneumaturia was observed when urethral foley catheter was administered. At the 5th day of antibiotherapy, control urine culture was negative and a cystolithotripsy procedure was planned for bladder stones. Urethra, bladder neck and prostate were observed normal in cystourethroscopy. There were no necrotic tissues or increased trabeculation in the bladder. A pneumatic lithotripter was used for fragmentation of a total of 11 stones in the bladder. Urethral foley catheter was removed on the 1st postoperative day.

Suprapubic pain did not relieve postoperatively. Clean intermittent catheterization (CIC) was offered to the patient when his residual urine volume was measured as 500 mL on ultrasonography. The patient was released from the hospital with a prescription of 14-day oral antibiotic therapy. At 1st month follow-up, urodynamic study revealed detrussor underactivity. Diabetic cystopathy was considered and continuation of CIC therapy was deemed appropriate for the patient.

Discussion

Emphysematous cystitis is a rare bladder infection associated with gas production. The presence of gas in urinary tract was first described in 1671, in a patient stating that air coming from the urethra. By the late 1800s, Eisenlohr first detected intramural gas in the bladder at an autopsy. In 1961, Bailey defined the disease as emphysematous cystitis [2]. Emphysematous cystitis is usually seen in older diabetic females. In their prevalence study of 153 cases, Toyota et al. have reported that 63.4% of patients with emphysematous cystitis is women and 66.7% is diabetic [3]. Apart from diabetes mellitus, neurogenic bladder, urethral catheterization, vesicorectal fistula, end-stage renal failure, bladder outlet obstruction and immunosuppressive conditions are present among the risk factors for emphysematous cystitis. Our patient had both diabetes mellitus and neurogenic bladder. Mechanism of gas formation in emphysematous cystitis is not yet fully understood. A generally accepted one is the accumulation of carbon dioxide and hydrogen in tissues as a result of fermentation formed by infective organisms. The primary factor for gas production is thought to be increased glucose in urine and tissues for diabetic patients, and albumin or lactose for non-diabetics [4]. Gas formation resulting from fermentation process increases local pressure and leads to the deterioration of tissue perfusion and infarct. Clinical signs of emphysematous cystitis are nonspecific. Clinical manifestations vary from asymptomatic or mildly symptomatic cases to cases with peritonitis or even with septic shock. Prevalent symptoms include dysuria, hematuria, increased frequency of urination, fever, suprapubic pain and pneumaturia. Although pneumaturia is a more specific symptom than others, it is quite rare [5]. Thomas et al.have reported that 7% of cases is asymptomatic and incidentally detected by abdominal imaging [2].

As in our case, the most common causative agent of emphysematous cystitis is Escherichia coli. In addition, Klebsiella pneumoniae, Enterobacter aerogenes, Proteus mirabilis, Staphylococcus aureus, Streptococci, Clostridium perfringens and Candida albicans are other isolated organisms [6].

Radiologically, the most appropriate option is CT. The appearance of small, multiple gas filled vesicles under the bladder mucosa is a characteristic finding. Grupper et al. have reported that air can be seen in the bladder wall and bladder lumen in 94.4% and 3.7% of the cases, respectively [7]. In our case, air was present in both the wall and lumen of the bladder. Computed tomography is also useful for differential diagnosis of other pathologies that could create gas in the bladder, such as colovesical and vesicovaginal fistula, trauma, gas gangrenes of uterus and the vagina [8]. Ultrasound has a lower sensitiv-

ity than CT, it helps determine bladder wall thickening and increased echogenicity. Cystoscopy is not sufficient by itself in the diagnosis of emphysematous cystitis, but can be used to evaluate a possible bladder outlet obstruction.

Treatment of emphysematous cystitis includes broad spectrum antibiotics, urinary bladder drainage, blood glucose level control and correction of the underlying predisposing disease. Antibiotic treatment should be performed intravenously. There is no common consensus on the duration of antibiotic therapy. Broad-spectrum antibiotics, such as ceftriaxone, fluoroquinolones, aminoglycosides or carbapenem should be given until the causative agent isolated [9]. Surgery including partial or total cystectomies is rarely required. In their case series of 135 patients with emphysematous cystitis or pyelonephritis, Thomas et al. reported that 90% was treated medically while the remaining 10% underwent cystectomy or nephrectomy [2]. If not treated, the infection can give rise to bladder rupture, spread to the kidneys or ureter, or may even cause death [10]. Although the mortality rate is about 7% for emphysematous cystitis, this ratio increases up to 14% if the upper urinary tract is affected. Although emphysematous cystitis is generally seen in diabetic females, our case reminds that it should always be kept in mind in the differential diagnosis of all patients including young males, who present with pneumaturia or suprapubic pain. Abdomen CT should be the preffered radiological diagnostic method. As in this case, results of timely and appropriate antibiotic therapy, and surgical interventions aiming to cure underlying pathology, are very successful.

Competing interests

The authors declare that they have no competing interests.

References

1. Wong JW, Pace KT. Emphysematous pyelitis, ureteritis and cystitis. Can Urol Assoc J 2010;4(6):148-9.
2. Thomas AA, Lane BR, Thomas AZ, Remer EM, Campbell SC, Shoskes DA. Emphysematous cystitis: a review of 135 cases. BJU Int 2007;100(1):17-20.
3. Toyota N, Ogawa D, Ishii K, Hirata K, Wada J, Shikata K, et al. Emphysematous cystitis in a patient with type 2 diabetes mellitus. Acta Med Okayama 2011;65(2):129-33.
4. Yang WH, Shen NC. Gas-forming infection of the urinarytract: an investigation of fermentation as a mechanism. J Urol 1990;143(5):960-4.
5. Yokoo T, Awai T, Yamazaki H, Fukuda Y, Hayashi F, Hosoya T. Emphysematous cystitis complication in a patient undergoing hemodialisis. Clin Exp Nephrol 2007;11(3):247-50.
6. Shigemura K, Yasufuku T, Yamashita M, Arakawa S, Fujisawa M. Bilateral emphysematous pyelonephritis cured by antibiotics alone: a case report and literature review. Jpn J Infect Dis 2009;62(3):206-8.
7. Grupper M, Kravtsov A, Potasman I. Emphysematous cystitis: illustrative case report and review of the literature. Medicine (Baltimore) 2007;86(1):47-53.
8. Grayson DE, Abbott RM, Levy AD, Sherman PM. Emphysematous infections of the abdomen and pelvis: a pictorial review. Radiographics 2002;22(3):543-61.
9. Stamm WE, Hooton TM. Management of urinary tract infections in adults. N Engl J Med 1993;329(18):1328-34.
10. Gheonea IA, Stoica Z, Bondari S. Emphysematous Cystitis. Case report and imaging features. Curr Health Sci J 2012;38(4):191-4.

How to cite this article:
Tağcı S, Özden C, Gökkaya CS, Aktaş BK, Bulut S. Emphysematous Cystitis: A Case Report. J Clin Anal Med 2016;7(1): 138-40.